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ART 34 AEDT

What is claimed is:

1. A fuel composition, comprising:
 - (a) a diesel fuel;
 - 5 (b) ethanol; and
 - (c) a surfactant comprising
 - (1) a hydrocarbylphenol or derivative thereof that is a Mannich base or an alkoxylated Mannich base;
 - (2) a hydrocarbyl-substituted polycarboxylic acid or anhydride or deriva-
10 tive thereof;
 - (3) a derivative of a hydrocarbyl alcohol that is an acetal, a ketal, or an orthoester; or
 - (4) a mixture thereofwherein the hydrocarbyl substituent of components (c)(1) and (c)(2) contains 4
15 to 20 carbon atoms, and the hydrocarbyl substituents of component (c)(3) contain 1 to 7 carbon atoms.
2. The fuel composition of claim 1 wherein the surfactant (c) further comprises at least one member selected from the group consisting of an alcohol, an alkoxylated alcohol, a fatty monocarboxylic acid or derivative thereof, and an
20 alkoxylated hydrocarbylphenol.
3. The fuel composition of claim 2 wherein the diesel fuel contains aromatic hydrocarbons from 3 to 60% by volume, the surfactant has a HLB value ranging from -30 to 20, and the HLB value of the surfactant is directly proportional to the aromatic content of the diesel fuel.
- 25 4. The fuel composition of claim 2 wherein the derivative of the fatty monocarboxylic acid is an ester, an amide, an amine salt, a hydroxyalkyl-substituted amide, an aminoalkyl-substituted ester, an alkoxylated acid, or a mixture thereof.
5. The fuel composition of claim 2, further comprising:
30 (d) a combustion improver.
6. The fuel composition of claim 5 wherein the combustion improver comprises an inorganic nitrate salt, a hydroxylamine compound, an organic nitro

compound, a compound having at least one strained ring group containing 3 to 5 ring atoms, or a mixture thereof.

7. The fuel composition of claim 1 wherein the surfactant comprises the Mannich base, the alkoxyated Mannich base, the acetal, the ketal, the orthoester,
5 or a mixture thereof.

8. The fuel composition of claim 7 wherein the Mannich base is prepared by the Mannich reaction of a hydrocarbylphenol, an aldehyde, and an amine.

9. The fuel composition of claim 8 wherein the Mannich base is the reaction product of dodecylphenol, formaldehyde, and diethanolamine.

10 10. The fuel composition of claim 1 wherein the derivative of the hydrocarbyl-substituted polycarboxylic acid or anhydride of component (c)(2) is the reaction product of an alkenylsuccinic anhydride and a tertiary amino alcohol.

11. The fuel composition of claim 1 wherein the diesel fuel comprises a middle distillate fuel, a Fischer-Tropsch fuel, a biodiesel fuel, or mixtures
15 thereof.

12. The fuel composition of claim 1 wherein ethanol comprises anhydrous ethanol, fuel grade ethanol containing up to 0.1% by weight water, hydrous ethanol containing up to 7% by weight water, or mixtures thereof.

13. The fuel composition of claim 5 wherein the diesel fuel is present at 55 to
20 99% by weight, ethanol is present at 0.5 to 25% by weight, the surfactant is present at 0.1 to 8% by weight, and the combustion improver is present at 0.005 to 10% by weight.

14. A method of operating a compression-ignited internal combustion engine, comprising:

25 fueling the engine with the fuel composition of claim 1.

15. A method of providing a stable fuel composition that contains a diesel fuel and ethanol, comprising:

adding a sufficient amount of the surfactant (c) to the fuel composition of claim 2.

30 16. A method of improving the lubricity of a fuel composition that contains a diesel fuel and ethanol, comprising:

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adding a sufficient amount of the surfactant (c) to the fuel composition of claim 2.

17. A method of reducing exhaust emissions of a compression-ignited internal combustion engine, comprising:

5 fueling the engine with the fuel composition of claim 5.

18. A method of providing a stable fuel composition to a compression-ignited internal combustion engine wherein the fuel composition provides improved lubricity and reduced exhaust emissions, comprising:

operating the engine with the fuel composition of claim 5.